Individual recognition of stone marten (*Martes foina*) based on forensic finger prints identification

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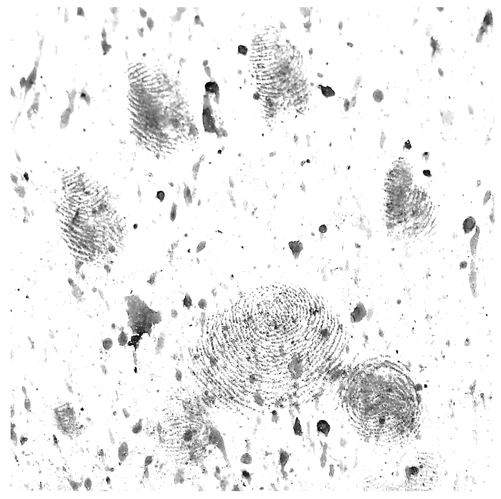
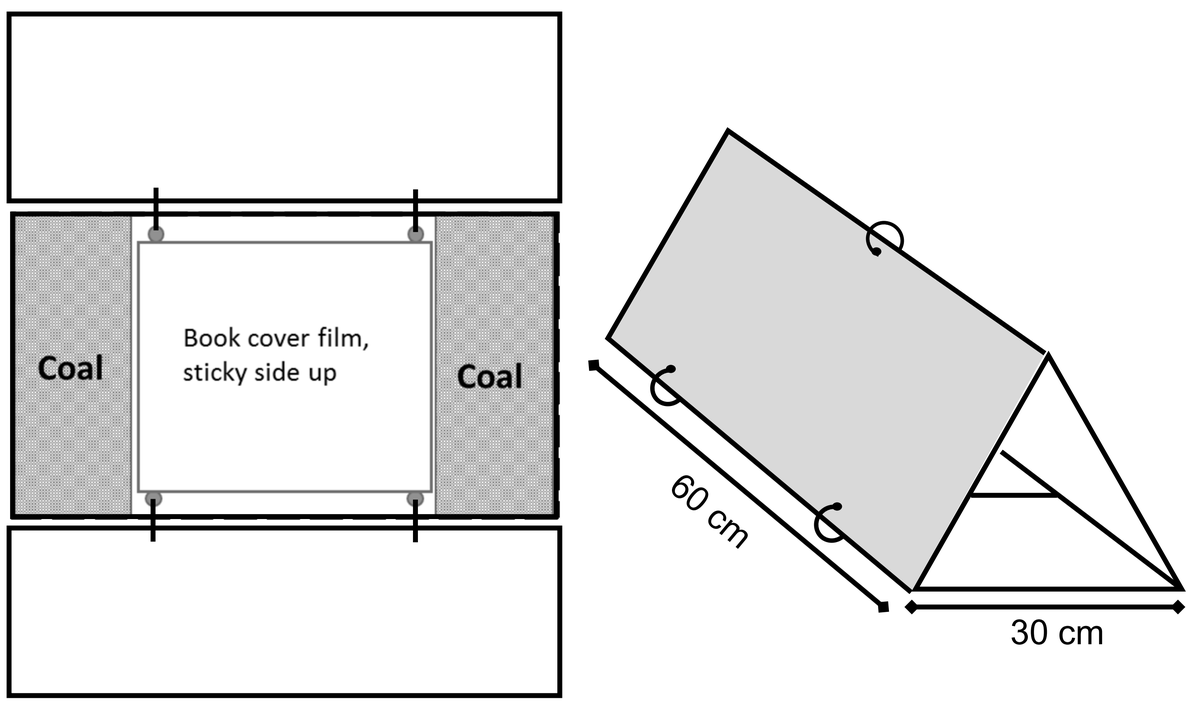
Objectives

Stone martens are an elusive species that is distributed throughout most of Europe, the Middle East and central Asia. Despite the fact that much is known on their ecology in Europe, there is little information about their biology and ecology in Israel (or the Middle East). We aim to develop a method for individual recognition of stone martens based on their fingerprints.





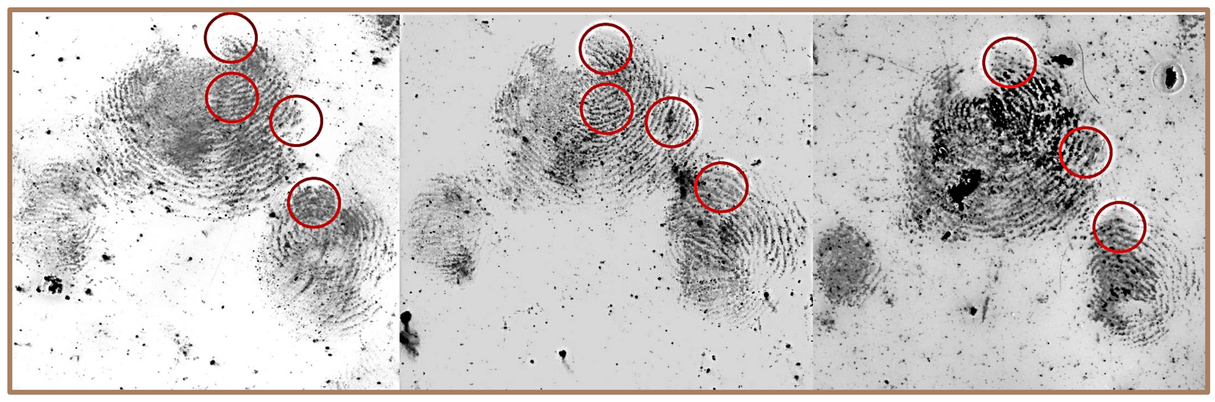
Methods

We placed 41 track plates along the slops of the reserve spaced approximately 50 meters apart. Stone martens capture rate success was between 0.32-0.6. We identified eight individuals based on marten's digits and paws friction ridge skin impressions shown on prints. We show for the first time that stone martens have unique markings on their digits and paws much like human fingerprints. We collaborated with Israel's Police Forensic Department (PFD) to validate our assumption. The validation was done by PFD experts based on data collected from the field and from 4 individuals in captivity.

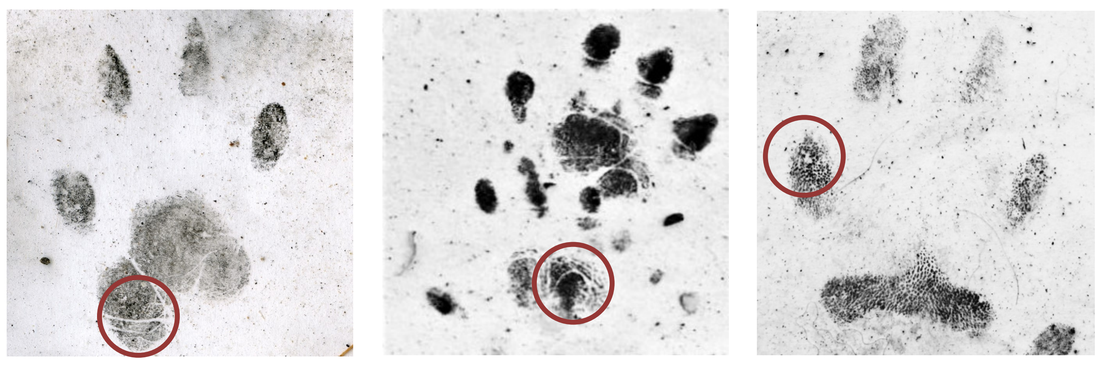
Results

We estimated martens population size based on individual recognition using a capture recapture approach for noninvasive methods, where the possibility of being captured in a single session is greater than one. On average, individual martens were captured on 1.75 (SD 1.035) track plates. The maximum time difference between recaptures was three years for one individual. Results suggest that Hutem Hacarmel marten density is 6-7 individuals per km, and estimated home-range size varied between 0.04-0.07 km^2.

Same individual in three different track plates.
Based on the marks on the front pad.



Herpestes ichneumon *Erinaceus concolor* *Vulpes vulpes*



○ Individual marks, skin line folds and skin creatine structure.

Discussion

We were able to effectively identify individual martens based on their fingerprints. Our method may also be effective for Egyptian mongoose (*Herpestes ichneumon*) and Southern white breasted hedgehogs (*Erinaceus concolor*), however, these species individual identification is done by markings that differ than stone martens (i.e., not fingerprints) based on skin folds.

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